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Futures Forum

Enhancing the Alignment of Higher Education with Long-term Workforce Needs

Prepared for:
Council on Virginia's Future

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Introduction

Almost 18,000 students were awarded associate's degrees and about 61,000 received a bachelor's degree or higher during the 2006-2007 school year in Virginia. With a national unemployment rate of 9.4% in July 2009 and an even higher 23.8% for individuals aged 16 to 19, some graduates have begun to question the value of their degree.

The national recession is affecting the ability of all job seekers to find jobs. However, some students will have a harder time than others landing their first job because the skills they acquired while in school are not demanded by a large enough pool of employers. The lack of demand may be occurring because certain industries are declining in the United States or turnover is not sufficient to warrant new employees.

The misalignment between available jobs and acquired skills begs the question: why weren't students better informed about the demand for the skills they dedicated two to four or more years to learn? Is the information available? Should educators be obligated to inform students of the prospects they face in obtaining a job when they graduate? Should state institutions be required to steer their resources toward training a workforce with skills that are expected to remain in demand over the next decade?

This white paper continues a discussion about education attainment and alignment to business needs that began in the first education Futures Forum, hosted by the Council on Virginia's Future on August 28, 2009. It concludes that there is misalignment in Virginia that differs by regions within the state. Consequently, it concludes the following:

1. Better information is needed to provide students, job seekers, and educators with the means to make more informed decisions.
2. Virginia is making progress in providing more information to students.
3. Because the mix of industries and their workforce needs vary across the state, it is important to develop regional strategies that engage business leaders.
4. It appears that the state is not taking an appropriately aggressive or comprehensive role in working with institutions of higher education to meet a common goal of reducing misalignment between the skills of the workforce and the expected needs of firms.
5. The integrity of the degree process requires continued vigilance.

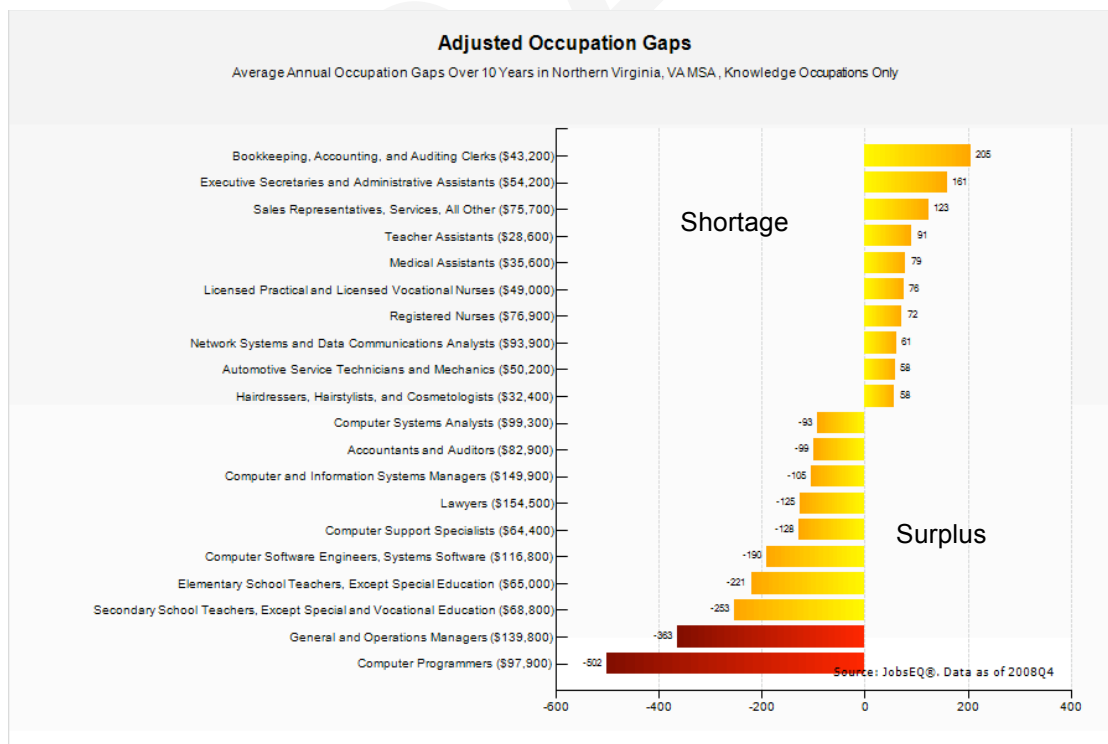
Is there Misalignment in Virginia?

A quick review of craigslist.org or monster.com reveals long lists of job openings, even during these bad economic times. On any day, there are a number of job openings because of the natural attrition and turnover that occurs at firms. Job openings are more suggestive of misalignments between the workforce and skills needed by companies if they are open for long periods of time and few applicants who apply for those jobs possess the skills needed to effectively carry out the required tasks.

Gaps Exist Between Occupation Supply and Demand

Misalignment between Virginia graduates and the skills needed by Virginia employers can be assessed by comparing the current workforce and expected occupations of graduates with the future needs of employers. As shown in the charts below, gaps between occupation supply and demand exist and vary by region because of differences in industry mix and the fact that not all individuals choose to relocate to regions where their skills are in demand. Moreover, a cursory view of the skills of the surplus occupations suggests they cannot substitute for the occupations that are in demand.

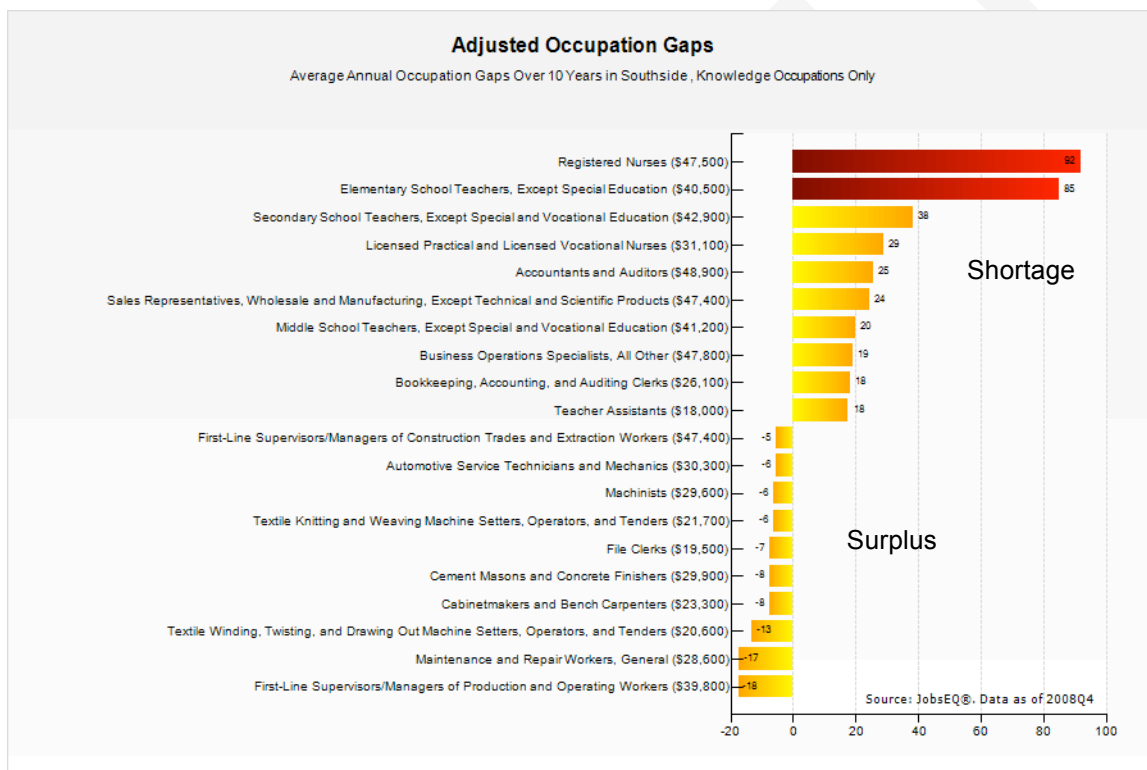
In the Northern Virginia metropolitan area, the expected occupation shortages and surpluses reflect a region that is dependent on professional business and high-tech firms. The chart indicates that of the occupations that typically require a two-year degree or greater, bookkeeping, accounting, and auditing clerks will have the greatest annual gap over the next ten years. Specifically, about 205 more of these occupations will be needed by businesses than are graduating in the region each year for the next ten years. More graduates are also needed in the health care occupations of medical assistant, licensed practical nurse, and registered nurse. At the opposite end of the spectrum are occupations where the number of graduates outpaces demand. The largest negative gap in Northern Virginia is expected to be computer programmers with a potential for seeing 502 individuals with such occupations unemployed each year in Northern Virginia over the next ten years.



Note: The dollar value in parenthesis after the occupation represents the average annual pay of that position.

In contrast to the Northern Virginia metropolitan area, the mainly rural Southside Tobacco Region is expected to see registered nurses as the largest shortage with licensed practical nurses as the only other medical-related occupation in the top ten occupations with shortages. Four occupations in the top ten, however, are teachers in the kindergarten through high school (K-12) levels.

The dependence of the region on the declining manufacturing sector is evident in the list of occupations that are no longer in demand. First-line supervisors of production workers are expected to show an excess of 18 workers a year for the next ten years in the region. Textile workers, machinists, and cabinetmakers also round out the list.

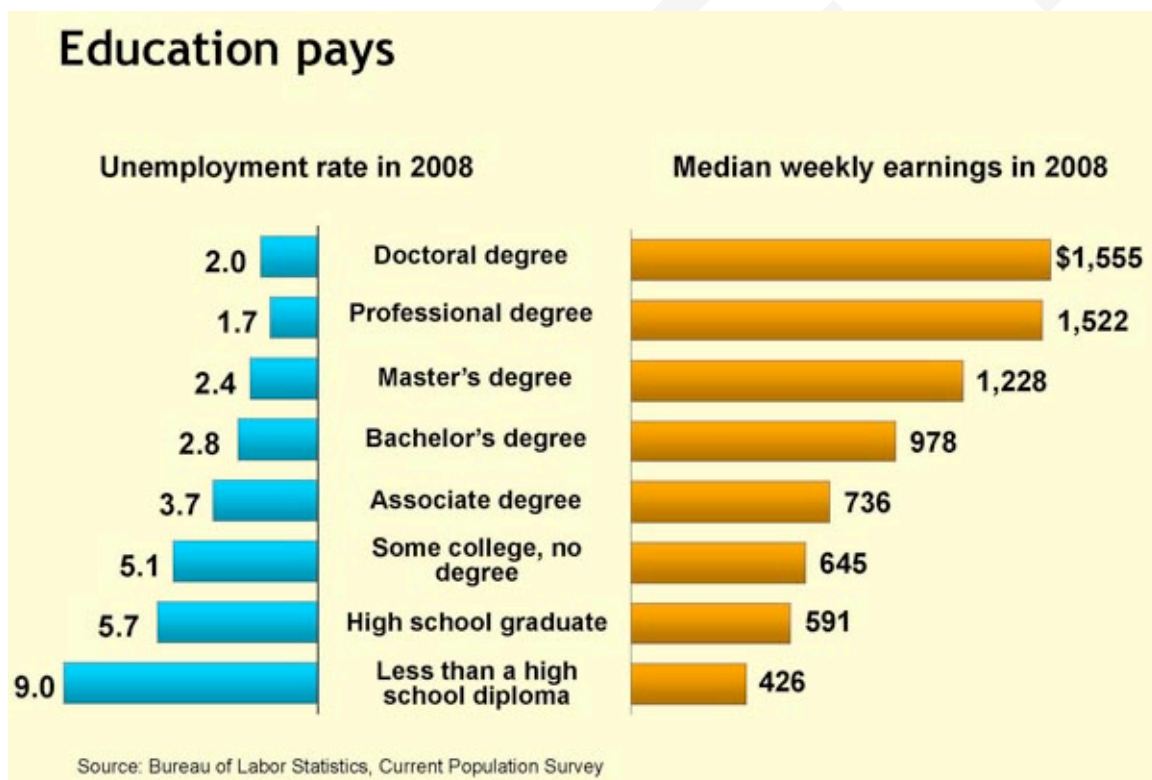


Note: The dollar value in parenthesis after the occupation represents the average annual pay of that position.

Why are Education Attainment and Workforce Alignment Important?

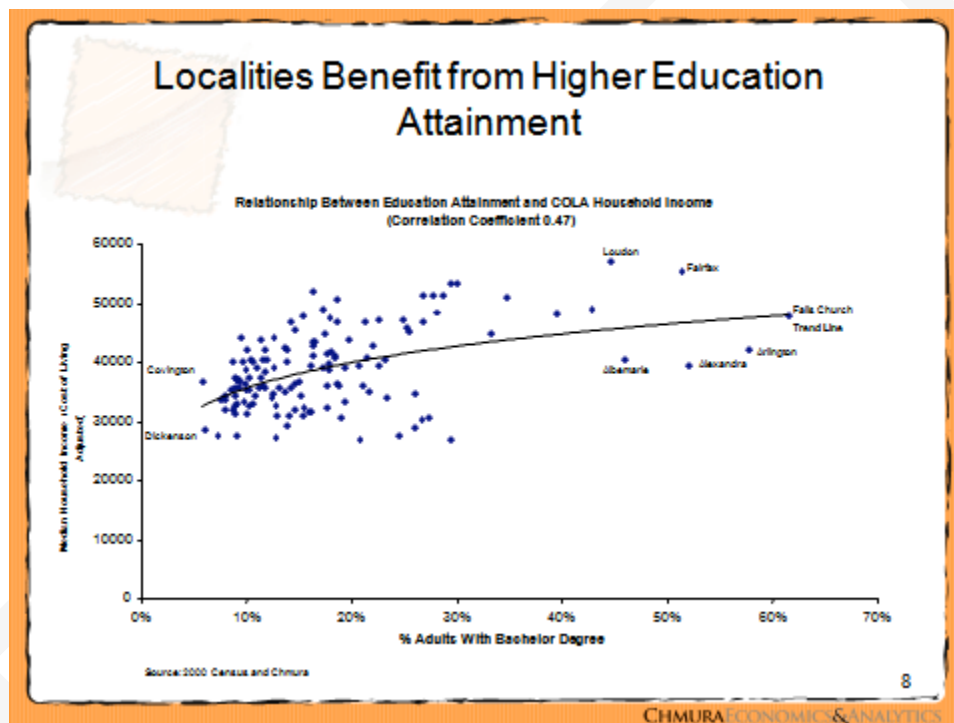
Individuals and Localities Benefit from Attainment

Education attainment is clearly beneficial to individuals. As shown in the chart below, individuals with advanced degrees experienced a lower unemployment rate in 2008 and higher median weekly earnings. For example, 9.0 percent of workers with less than a high school diploma were unemployed in 2008 and those who were working earned a median weekly \$426 compared the a 1.7 percent unemployment rate for individuals with professional degrees and median earnings of \$1,522.



Regions also benefit from higher education attainment. Studies show that counties with the highest average years of school completed also have the highest productivity, which leads to higher living standards.¹ The same holds true within the United States where a higher percentage of the population age 25 and over is associated with a higher per capita income.²

Even within the state of Virginia, education makes a difference in the growth rate of localities. After adjusting for cost of living differences, median household income is higher in localities where a higher percentage of the population has a bachelor's degree (see chart below). A study of Virginia counties and cities concluded that "...education and the knowledge level of a workforce do not directly drive job creation. Their contribution comes from improving the capacity of a region to attract investment, fostering entrepreneurial activities, and improving productivity."³ As noted earlier, improved productivity leads to higher household income, which results in higher living standards.



¹ Federal Reserve Bank of Dallas 2004 Annual Report, "What D'Ya Know?," page

² Ibid.

³ Xiaobing Shuai, "Education Underpins Drivers for Virginia's Growth," *Virginia Economic Trends*, 3rd quarter 2004, pages 5 and 6.

Alignment Reduces Costs to the State

Better decision-making on the part of job seekers, educators, economic developers, and workforce officials will increase the flow of resources toward their highest return.⁴ Although a precise value cannot be placed on the savings from reduced unemployment and lost wages, the number of unemployed in Virginia in July 2008⁵ along with marginal tax rates and unemployment insurance costs provide some potential savings scenarios. Reducing the number of unemployed in Virginia by 0.5 percent to 3.0 percent can save between \$1.5 and \$8.8 million in unemployment insurance expenditures and lost state taxes.

Tax Effects from Reducing the Number of Unemployed

Reduce the Number of Unemployed by:	Number of Workers Affected ¹	Reduced Unemployment Insurance Payments ²	State Tax Payments ³	Total Savings & Tax Payments
0.5%	597	\$1,232,208	\$240,591	\$1,472,799
1.0%	1,194	\$2,464,416	\$481,182	\$2,945,598
2.0%	2,389	\$4,930,896	\$962,767	\$5,893,663
3.0%	3,533	\$7,395,312	\$1,443,949	\$8,839,261

1. The July 2007 unemployment total of 119,437 was used to estimate the number of workers affected.
2. The unemployment insurance benefit was estimated using the average weekly benefit as of July 2007. In this case, each worker is assumed to receive a weekly benefit of \$258 for eight weeks.
3. State taxes are calculated assuming that the unemployed were paid the average annual wage in Virginia of \$45,620. Under this scenario these individuals would have paid \$2,193 in state taxes, assuming they took the \$3,000 standard deduction. It also assumes that they would have been unemployed eight weeks, the mean duration of unemployment in the nation in July 2007.

⁴ The flow of resources will be constrained by worker preferences. Not all individuals seek a job with the highest salary. However, with good information job seekers can choose the best alternative within their sphere of desired outcomes.

⁵ July 2007 was chosen as a point of reference instead of current data because the recession would bias the numbers higher than the historical norm.

Alignment is Needed to Remain Competitive

Available land and buildings no longer drive firm expansion and relocation decisions. Alignment is also needed for a state and region to remain competitive because firms need a ready workforce to remain in a region or to expand into a new region. When Governor Kaine announced 500 new jobs for Prince George County late in 2007, he said, “Rolls-Royce’s decision to locate these operations here is a strong affirmation of the talent and professionalism of our educated, high-tech workforce and Virginia’s competitiveness globally.”⁶ Less than a year later, he said Goodyear Tire & Rubber Company planned to invest \$200 million to improve the technology at the Danville plant that would “keep more than 2,200 jobs in the region.” The Goodyear Tire & Rubber announcement also stated that:

The Governor's Senior Advisor for Workforce, Virginia Jobs Investment Program, West Piedmont Workforce Investment Board, the Virginia Workforce Council and staff, the Virginia Community College System, and the U.S. Department of Labor worked with the company and other employers in the region to develop a long-term workforce pipeline plan that will continue to train and retrain employees in the region.⁷

Although small businesses create the majority of new jobs in an economy, losing a large corporation such as Goodyear would be a blow to any region in the Commonwealth.

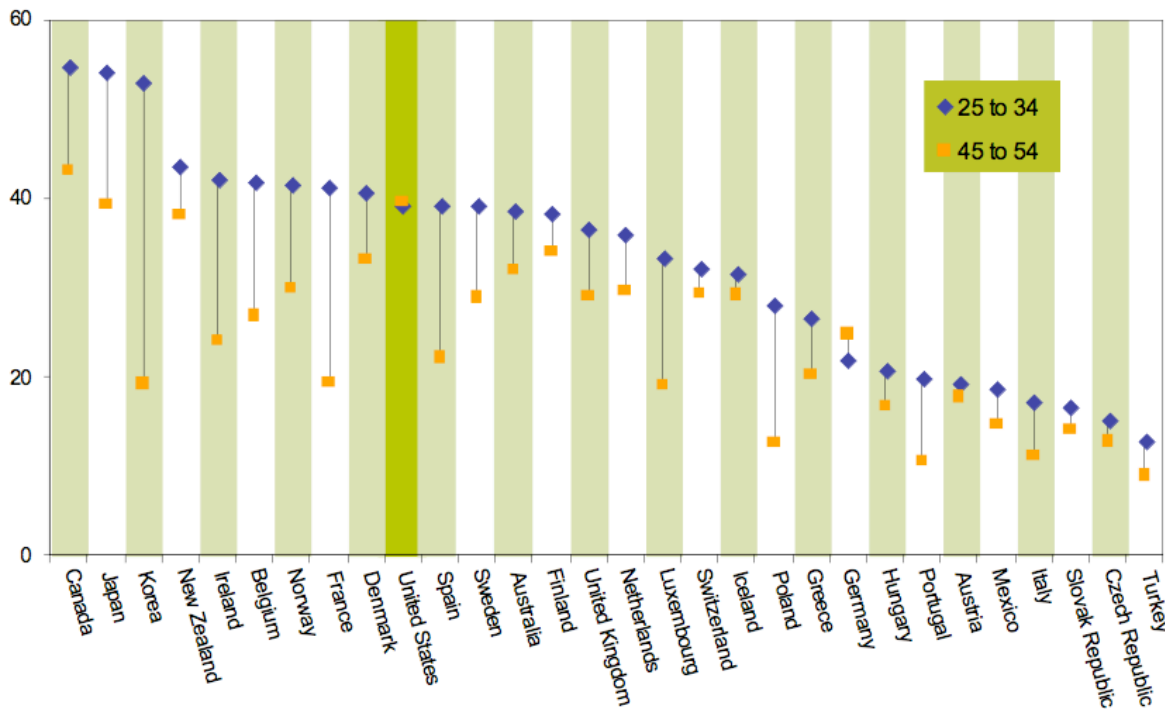
Misalignment can exacerbate other issues. For instance, a recent analysis by the National Center on Higher Education Management Systems indicates that Virginia’s public institutions would need to produce an additional 70,000 college degrees or more over the next 10 years to meet the current international higher education attainment benchmark. This “degrees gap” is particularly worrisome because Virginia’s 25-to-34-year-old cohort is not as well educated as its older 35 to 54 year old cohort.

This drop in attainment levels mirrors what has happened in the United States and only one other developed country, Germany. Twenty years ago, the United States led the world in the educational achievement of its citizens. Since then, however, as demonstrated by the chart on the next page, countries as diverse as Canada, Korea, Ireland, France and New Zealand have surged past the United States in educating their younger adults.

⁶ November 20, 2007 press release “Governor Kaine Announces 500 New Jobs for Prince George County” can be found at <http://www.governor.virginia.gov/mediarelations/NewsReleases/viewRelease.cfm?id=545>.

⁷ June 27, 2008 press release “Governor Kaine Announces Goodyear Modernization Project in City of Danville” can be found at <http://www.governor.virginia.gov/mediarelations/NewsReleases/viewRelease.cfm?id=692>.

Differences in College Attainment (Associate & Higher) Between
Younger & Older Adults, U.S. and OECD Countries, 2006



Source: Organization for Economic Cooperation and Development, NCHEMS

The United States will lag behind a growing number of international competitors if current growth in international attainment rates continues. Education attainment is also increasing at a dramatic rate in the emerging economies of China and India. Even if rates of attainment remain low in those countries, the vast numbers of new and highly trained talent will put increasing pressure on more expensive U.S. workers.

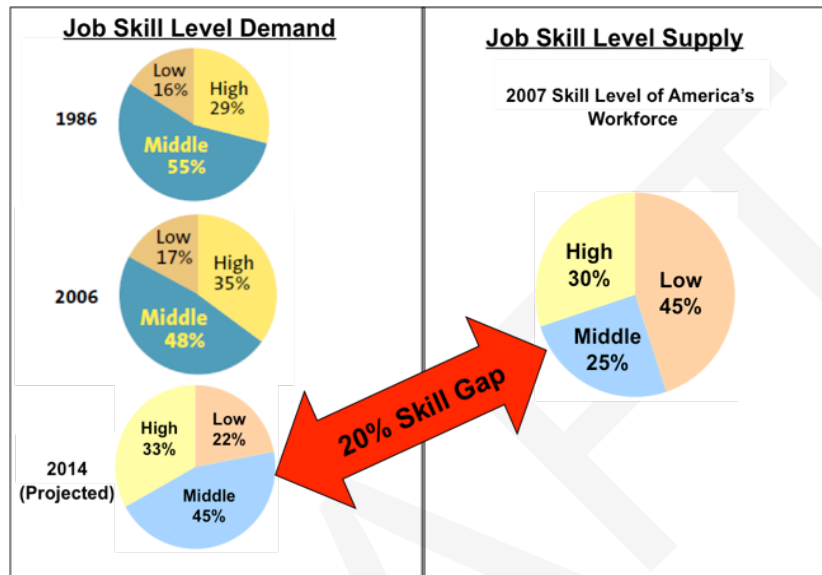
Why is there Misalignment?

Industry Mix is Always Changing

Some degree of misalignment between worker skills and available jobs will always persist in the economy because of the constant creation and destruction of firms and industries caused by forces such as technological improvement, international trade, changing policies, and changes in consumer preferences. These non-controllable drivers of misalignment are exacerbated by the fact that industries employing some of the lowest skilled workers have been shedding jobs

while those needing higher skilled workers have been adding jobs. In 1985, 16 percent of the workers required to run businesses were classified as low skilled⁸ and 29 percent were high skilled as shown in the diagram below.

Job Demand by Education/Training Shows a Mismatch by Skill Level



Source: ACT.

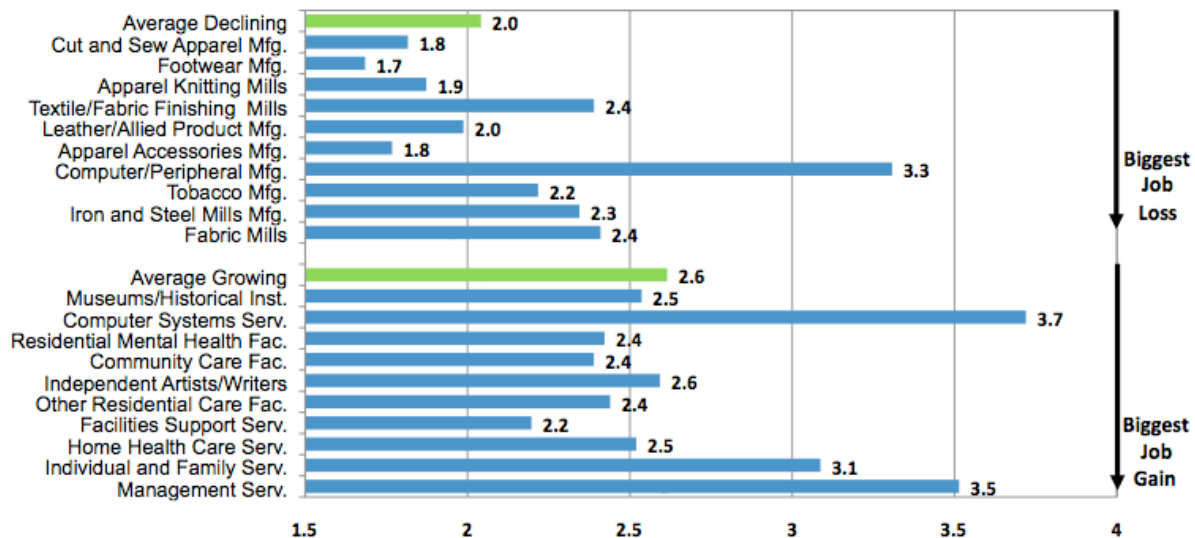
See Note 8 below for explanatory detail.

Industry is demanding higher skilled workers in order to remain competitive in a global economy. For instance, manufacturing jobs are declining overall; but within the industry, the demand for highly skilled workers is increasing from more advanced, high-tech, high-productivity manufacturing firms. At the national level, the demand for jobs requiring low and high skills are both expected to increase by four percentage points from 1986 to 2014. Although jobs requiring middle-skills (two years of education and/or training beyond high school) are expected to shrink during that same period, only 25% of America's workforce is expected to possess that level of skill creating a 20-percentage-point gap. A gap for high-skilled workers is also expected but should be smaller than that for middle skills.

⁸ The supply side is based on education attainment. Low Skill = high school or less. Middle Skill = two years of education/training beyond high school. High Skill = four-year degrees and higher. The **demand side** compares requirements of jobs based on education and/or skills need to be successful on the job. This information comes in part from the ACT Job Pro database and test and BLS O*NET information.

As shown in the chart below, even within the Commonwealth, the industries expected to grow at the fastest pace over the next decade are those that generally employ workers with higher skills.

Higher Skills are Needed for Fast Growing (Services) Industries Occupational Skills of Fastest Growing and Declining Industries, Virginia, 2005-2018



New Skills are Needed within Occupations

These data are consistent with the view that a rapidly growing number of workers at every skill level are being exposed to competition from lower wage countries. Advances in digital technologies and the growing openness of global trade will continue the trend. Employers everywhere will have growing access to a world-wide workforce and will have growing choices around the best locations – balancing factors like cost, quality, and access – for locating significant business functions and operations. This shift has been most noticeable for routine production jobs, but service and professional occupations are also being opened to international competitors.

Automation will also continue to play an important role in skill requirements. According to a recent report from The New Commission on the Skills of the American Workforce⁹:

“With the rapid advance of new technologies, it is becoming progressively less expensive to automate functions that used to be performed by people. As the cost of

⁹ Tough Choices or Tough Times, The Report of the New Commission on the Skills of the American Workforce, National Center on Education and the Economy, Washington, DC, 2007.

labor rises and the cost of automating jobs continues to fall, it becomes both possible and necessary for firms simply to eliminate jobs now being done by humans. Earlier, almost all jobs subject to automation were low-skill jobs. That is no longer true. Now it is more appropriate to say that the jobs that are the most vulnerable are the jobs involving routine work. Many good, well-paying, middle-class jobs involve routine work of this kind and are rapidly being automated.”

In a recent study completed by the McKinsey Global Institute,¹⁰ the authors found that technology was having two important effects on the labor market. First, as expected, they found that technology advances have depressed the employment share and wages of routine manual and cognitive workers. On the other hand, the authors found that highly trained and adaptable workers profited from increasing demand for non-routine analytical and cognitive tasks driven by skill-based technology and new process innovations.

The McKinsey report also found that firms competing directly (or indirectly as suppliers) in international markets are becoming more organizationally complex, requiring a new type of middle manager. These new middle managers must be able to handle complex information sets, deal with international supply chains and multiple corporate divisions, manage varied reporting relationships, and, especially important in today’s hyper-competitive marketplace, do it all at a much faster pace than ever before.

Future college graduates will enter a workplace vastly different than the one of just a few years ago. This marketplace will especially reward those individuals who can bring not only hard skills (finance, engineering, etc.) but also a set of cognitive and creative skills that can help them to not only adapt quickly to fast-paced, technologically-intense environments, but also to help shape the future of those environments for their employers. Lower level workers will also be challenged – those that can bring more than just hard skills to the table for their employers – like imagination and teamwork – will be more valued and more highly rewarded than those whose contributions can be more easily automated or matched by overseas producers.

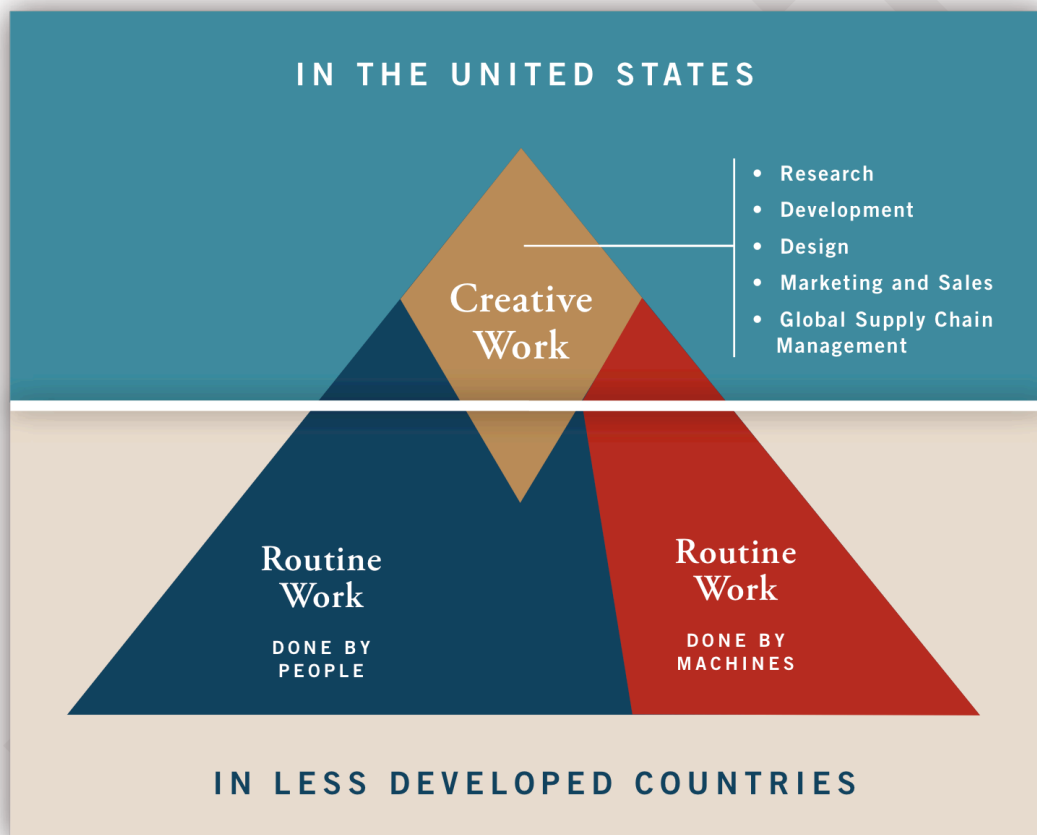
This evolution of the workplace will continue to have dramatic impacts on America’s workforce. The New Commission on the Skills of the American Workforce put it succinctly:

“This is a world in which a very high level of preparation in reading, writing, speaking, mathematics, science, literature, history, and the arts will be an indispensable foundation for everything that comes after for most members of the workforce. It is a world in which comfort with ideas and abstractions is the passport to a good job, in which creativity and innovation are the keys to a good life, in which high levels of education – a very different

¹⁰ Changing the Fortunes of America’s Workforce: A Human Capital Challenge, McKinsey Global Institute and the McKinsey Social Sector Office, June 2009.

kind of education than most of us have had – are going to be the only security there is. The best employers the world over will be looking for the most competent, most creative and most innovative people on the face of the earth and will be willing to pay them top dollar for their services. This will be true not just for the top professionals and managers, but up and down the length and breadth of the workforce.”

In this world, the most successful industries – and regions – will be those that can attract, develop, and retain the best workforce, one with the creativity and talent to compete with the best in the world. The Commission sees the composition of work in a thriving industry in the future – if all goes well – to be something like this:



Source: Tough Choices or Tough Times, The Report of the New Commission on the Skills of the American Workforce, National Center on Education and the Economy, Washington, DC, 2007.

Many industry leaders believe that we are not meeting the challenges that these changes are presenting. Misalignment will accentuate these issues, but these studies and the discussion at the forum indicate that alignment is not a simple issue of lining up degree offerings with job prospects; unless our student possess the complete skill set needed in a global marketplace, we will not be preparing them properly. Thus, assessing the value of a degree – and the integrity of the degree-awarding process – is more complicated than it has ever been.

Predicting Future Workforce Needs is Difficult

Markets work better when both buyer and seller have better information. But getting good information to students is difficult for many reasons, not the least of which is that students are beginning to make career choices years before entering the workforce. Given the pace of change highlighted earlier in this paper, the accuracy of longer-range predictions of workforce needs is problematic.

Changing economic conditions also affect forecast accuracy. The current economic contraction, for example, is reducing the demand for most jobs. When the recovery takes hold, however, demand and forecasted gaps will return as well.

Major policy changes or economic development projects can also have significant, and hard-to-predict, impacts on forecasts. For instance, relocations to Virginia from the federal base realignment and closure (BRAC) decisions will add more than 1,500 jobs annually to Northern Virginia, and new policies and programs to foster growth of the “green” economy are projected to add an additional 2,073 jobs per year. The concomitant growth in federal contractor jobs could add yet another 4,185 jobs per year.¹¹

In addition, the investment decisions by Rolls Royce (Prince George) and Northrop Grumman/CGI (Southwest) are having major impacts on their regional economies. In general, forecasts for emerging workforce skill needs are more accurate at the statewide or metropolitan level than smaller regions such as counties.¹² For that reason, it is desirable to have industry leaders involved in providing input to regional and state level forecasts. In general, existing industry has a good handle on their longer-term workforce needs.

Economic and other factors can also come in to play in hard-to-predict ways. The economic downturn has led many nurses in Northern Virginia to remain in the workforce, thus mitigating the region’s nursing shortage. If job prospects for spouses strengthen, more nurses might decide to leave the workforce or cut back on hours worked.

Finally, even if perfect information were available to students and colleges, it is unlikely that there would be perfect alignment. Student choice, which will always be influenced by more than cold facts, will play an important role in determining course and degree offerings. As noted at the forum, we do not live in a “command and control” economy. However, the issue is that

¹¹ Mid-Atlantic Regional Cooperative, *Workforce Development System Gap Analysis and Asset Mapping for BRAC Impacted Areas in the MARC Region*, August 2009.

¹² A forecast at the county level would not be accurate, in part, because the labor pool is larger than county lines. For that reason, forecasts should always take into account the labor market shed that includes the majority of commuters to firms within a region.

student choice may be playing too big a role and it appears that the state is not taking an aggressive enough role in influencing higher education decision-making.

Despite imperfect forecasts and other problems, the best information available should be provided to students and displaced workers to help them inform their decisions.

Does Virginia Need to Change?

Based on projected occupation gaps between supply and demand, other states are facing similar misalignment issues that are expected in Virginia. However, it is unclear if other states are deploying effective strategic initiatives to close workforce gaps.

An innovative product that the Virginia Community College System (VCCS) made available to the public this past year is helping to provide information that has the potential to reduce misalignment. The Virginia Education Wizard (www.vawizard.org/vccs) is a web portal that helps students identify potential careers that are in demand in their region and better understand what is required for those careers. The site includes information needed to compare costs across colleges, obtain financial aid, consider transfer agreements between two- and four-year colleges, and apply to a two-year college.

The Education Wizard will also support the Virginia Department of Education's new requirements for students to begin developing career plans in the 7th grade and will play a role in the Commonwealth's evolving Career Pathways program. Moreover, plans are underway to significantly expand the Wizard to include four-year institutions and proprietary schools, along with more information about certificates and apprenticeship opportunities.

Although the Education Wizard goes a long way toward providing Virginians with the information needed to make better decisions about career choices, more information needs to be directed toward higher education institutions and training providers so they can determine whether their offerings are in sync with the needs of local businesses.

The process of reducing misalignment is complicated by the constant churn in the economy from expanding and declining industries, by shifting skill requirements within occupations, and the ongoing economic cycles of growth and expansion. At the local or regional level, shifts by just one or a few employers or changes in government policy can have dramatic employment consequences. Finally, informing emerging workers about demand occupations will not be fruitful if the education they receive does not sufficiently prepare them for the responsibilities they will face on their jobs.

